

**Amendments to the Claims:**

This listing of claims will replace all prior versions, and listings, of claims in the application:

**Listing of Claims:**

1 (currently amended): A color coded bead comprising a reversible photochromic compound in a polymeric matrix~~medium~~, the bead having a receptor molecule on its surface;

wherein the photochromic compound confers on the bead a distinct optical signature; and

wherein the receptor molecule is capable of binding to a target analyte, and wherein said color coded bead is for use in a 2-dimensional microarray for detecting target analytes.

2 (original): The bead as defined in claim 1 wherein the distinct optical signature is developed by actinic radiation.

3 (original): The bead as defined in claim 1, wherein receptor molecule is biological or chemical.

4 (original): The bead as defined in claim 1, wherein the bead comprises a mixture of different photochromic compounds.

5 (original): The bead as defined in claim 1, wherein the bead comprises a mixture of photochromic and non-photochromic compounds.

6 (original): The bead as defined in claim 1, wherein the distinct optical signature is produced by controlling a ratio of at least two photochromic compounds or a ratio of at least one photochromic compound and a non-photochromic compound.

7 (original): The bead as defined in claim 1 wherein the distinct optical signature relates to the receptor molecule on its surface.

8 (original): The bead of claim 1 wherein the medium is organic or inorganic.

9 (canceled):

10 (original): The bead of claim 1 wherein the medium is an amorphous polymer.

11 (original): The bead of claim 1 wherein the medium is polystyrene or poly(methylmethacrylate).

12 (original): The bead as defined in claim 7 wherein the optical signal is fluorescence, absorbency, or chemiluminescence.

13 (original): The bead as defined in claim 1 having a mean diameter of 1 to 50 microns.

14 (original): The bead as defined in claim 1 having a mean diameter of 5 to 20 microns.

15 (currently amended): A microarray comprising a 2-dimensional support, on which are disposed the beads defined in claim 1, wherein said microarray is for detecting analytes.

16 (original): The microarray as defined in claim 15, wherein the beads are arranged on the support in random or in orderly distribution.

17 (original): The microarray as defined in claim 15, wherein the beads are attached to the support by physical or chemical means.

18 (original): The microarray of claim 15 wherein the support is modified to allow attachment of the microspheres.

19 (original): The microarray of claim 13 wherein the support comprises polymer or glass.

20 (original): The microarray of claim 13 wherein the laydown of microspheres on the support is 100 to a million per cm<sup>2</sup>.

21 (original): The microarray of claim 15 wherein the laydown of microspheres on the support is 10,000 to 100,000 per cm<sup>2</sup>.

22 (withdrawn): A method of identifying target analytes, the method comprising the steps of:

- a) providing the microarray of claim 15, wherein the beads carry receptor molecules to which the target analytes can bind;
- b) enabling the target analytes to bind to the receptor molecules thereby producing an optical signal;
- c) detecting the optical signal, indicating presence of the targeted analytes on the bead;
- d) subjecting the beads to actinic radiation;
- e) interpreting the color change in the bead to identify the receptor molecule involved.

23 (withdrawn): The method of claim 22 wherein the target analytes are labeled with optical emission tags.

24 (withdrawn): A method of identifying target analytes, the method comprising the steps of:

- a) providing the microarray of claim 15, wherein the beads carry receptor molecules capable of binding to the target analytes;
- b) enabling the target analytes to bind to the receptor molecules thereby generating optical signals;
- c) recording the signals as Image A;
- d) activating the photochromic compounds in the beads into color signatures and recording them as Image B; and

e) matching Images A and B to determine the identity of the analyte.

25 (currently amended): The color coded bead of claim 1 wherein the photochromic compound is a member of the group consisting of dihydropyrene, a 1,4-2H-oxazine, a spirothiopyran, a naphthopyran, a triphenylmethane, a benzopyran, an azobenzene, a dithizone metal complex, a thioindigo, a spirooxazine, a spiropyran, a diarylethylene compound and/or a fulgide.

26 (original): The color coded bead of claim 1 further including a light stabilizer.

27 (original): The color coded bead of claim 1 wherein the light stabilizer is a plasticizer, a hindered amine, a hindered phenol or an excited state quencher.